NEW *APION (COELOCEPHALAPION)* SPECIES (CURCULIONIDAE: APIONINAE) FROM FRUITS OF *PTEROCARPUS* (LEGUMINOSAE: FABOIDEAE) IN CENTRAL AMERICA

DONALD R. WHITEHEAD

Systematic Entomology Laboratory, IIBIII, Agr. Res. Serv., USDA[1]

ABSTRACT

Apion pterocarpi (Bagaces, Guanacaste Prov., Costa Rica; fruits of *Pterocarpus rohrii* Vahl), *A. pepperi* (Mexico, indefinite locality; fruits of *P. orbicularis* DC), and *A. cartwrighti* (Turrialba, Cartago Prov., Costa Rica; host plant not known) are described as new, classified, keyed, and illustrated. These 3 species form a compact unit most closely related to *A. latipes* Sharp, in the *annulatum* group of the subgenus *Coelocephalapion.*

As Kissinger (1968) found, insufficient data are available for working up a complete revision of the North and Central American Apioninae. Many forms were left undescribed because they were represented by few specimens, often only of the difficult-to-interpret females, and obviously many tropical species were completely unrepresented; I suspect that about 90% of the Central American *Apion* fauna remains unknown. Moreover, natural history data are lacking for most of the known tropical forms. In view of the tremendous diversity in this and some of the other weevil groups in the New World tropics, therefore, I propose to deal in piecemeal fashion with species associated with particular groups of plants. This paper is the first in a projected series to focus on certain tropical American *Apion* species that are either under ecological study or of known or suspected agricultural importance.

In Costa Rica, *Pterocarpus rohrii* Vahl (=*P. hayesii* Hemsl.) is a tropical deciduous tree characterized by synchronized fruiting in 2 or 3 year cycles, and it therefore has been selected for close, long-term ecological observation by my friend D. H. Janzen (University of Pennsylvania). His fine series of *Apion* from fruits of this tree formed both the impetus and the core for this study. Descriptions roughly follow Kissinger's (1968) format, terminology, and technology. Illustrations were prepared by I. C. Feller, supported by Janzen's NSF Grant BMS 75-14268. I am indebted to R. W. Hodges, D. H. Janzen, and G. C. Steyskal for comment and criticism.

In the New World, *Pterocarpus* has not previously been recorded as a host genus for *Apion.* The 3 *Apion* species treated herein form a compact group readily recognized by large body size, somber coloration, strongly compressed body form, and technical characteristics. They belong to the *annulatum* species group of the subgenus *Coelocephalapion.* Two are known to attack fruits of *Pterocarpus,* and I predict from morphological characteristics that the third does also. The 2 *Pterocarpus* species mentioned in this paper are of negligible commercial value, but the genus does include several other species of value as timber.

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[1] Mail address: c/o U.S. National Museum, Washington, D.C. 20560

In Kissinger's (1968, p. 208) key to males of North and Central American *Coelocephalapion*, these 3 species trace readily to couplet 7 where they agree with *A. latipes* Sharp in having tarsus 3 unmodified; but the elytra are not bluish, and the femora are not bicolored. Although they agree also in compressed body form with *A. latipes,* which among described species is probably their nearest relative, they differ sufficiently in genital characteristics that I suspect the relationship is not close. Adults of *A. latipes* and the 3 new species are distinguished in the following key.

1. Elytra bluish; femur part red, part black .... *A. latipes* Sharp.
1'. Elytra piceous or dark castaneous, not bluish; femur uniformly piceous or dark castaneous or ferruginous.................................. 2

2(1'). Pronotal punctations dense, interspaces on average much less than half diameters of each, scales fine but conspicuous under high magnification.. 3
2'. Pronotal punctations less dense, interspaces on average about half diameters of each, scales minute and inconspicuous even under high magnification; Costa Rica.. ....*A. cartwrighti* Whitehead, new species.

3(2). Vestiture fine, inconspicuous at low magnification; length of body less than 3.5 mm; Costa Rica .... *A. pterocarpi* Whitehead, new species.
3'. Vestiture coarser, conspicuous at low magnification; length of body more than 3.5 mm; central Mexico .... *A. pepperi* Whitehead, new species.

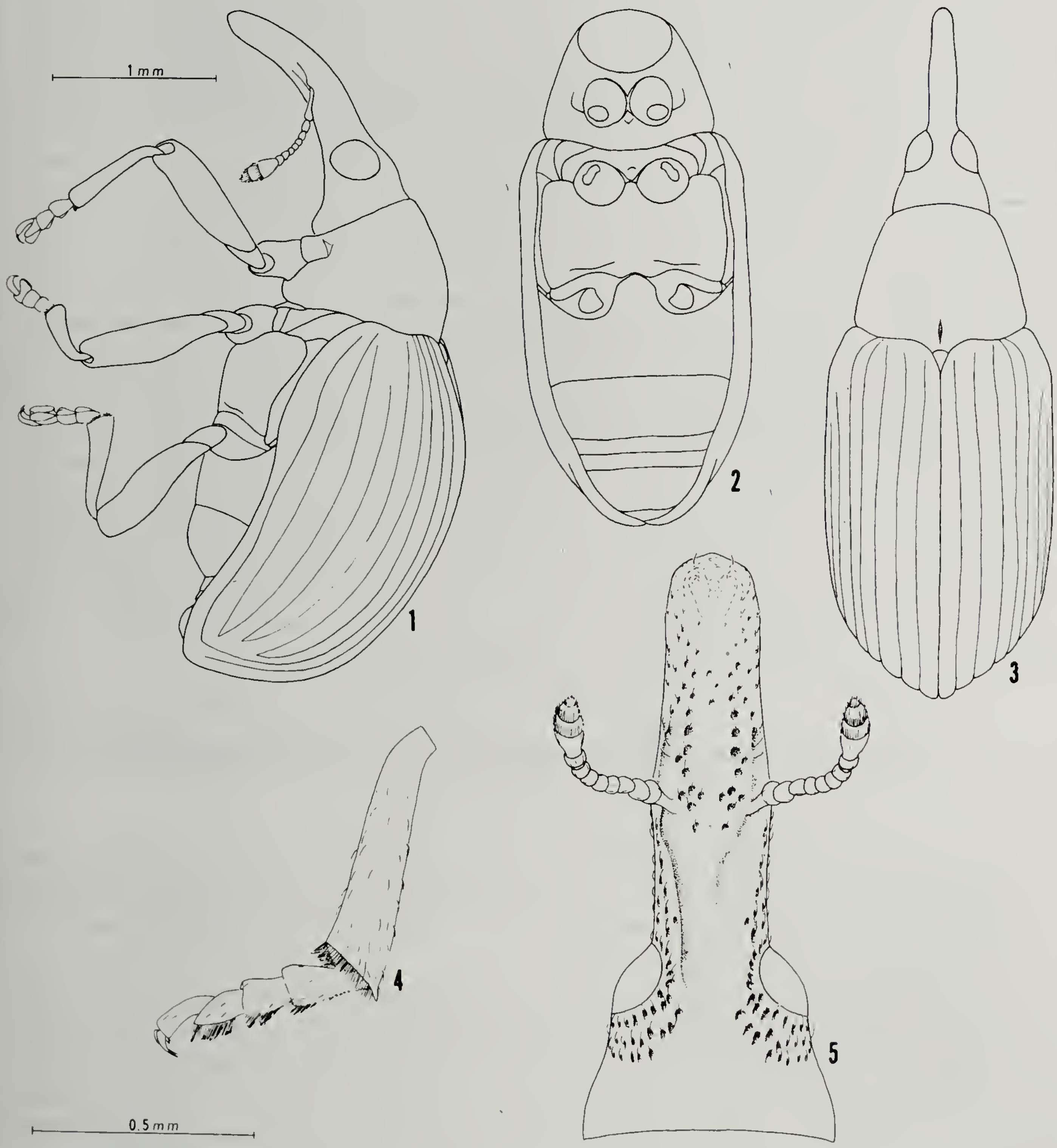
As is implicit in this key, adults of the 3 new species are remarkably similar in external characteristics; but in male genital characteristics, especially in detailed structure of the paramere (figs. 17, 20, 23), they are highly distinctive. Thus, despite lack of evidence about sympatry, they unquestionably represent distinct biological species. Since there are at least 5 widespread species of *Pterocarpus* in Mexico and Central America and several others in South America, I predict that this group of *Apion* is much more diverse than presently known and that its species are much more widely distributed than suggested by known records. I therefore think it premature to present a detailed hypothesis of phylogenetic relationships at this time.

Apion (Coelocephalapion) pterocarpi Whitehead, **new species**

Figs. 1-7, 11-12, 16-18

Type-material. Holotype male (USNM #75312), allotype female, and 18 paratypes labelled "COSTA RICA Guanacaste Prov. D. H. Janzen et al/Bagaces (COMELCO) 9 Mar. 1973/ex fruit Pterocarpus rohrii Vahl"; 4 paratypes, same locality and host, 19 March 1971, D. J. Janzen #595; 66 paratypes, same locality and host, 26 March 1971. In U.S. National Museum of Natural History; some paratype specimens will be distributed to various museums.

Comments. A. pterocarpi is known only from the type-locality, reared from fruits of *Pterocarpus rohrii* Vahl (= *P. hayesii* Hemsl.). At Santa Rosa National Park, about 60 km north of the COMELCO ranch, D. H. Janzen (pers. comm.) found another population of *Pterocarpus rohrii.* There, however, the fruits were heavily infested with an undescribed species of *Amblycerus* (Bruchidae; J. M. Kingsolver, pers. comm.) rather than the *Apion.* Although the 2 populations of *Pterocarpus* are currently regarded as conspecific, fruits of the Santa Rosa population are about twice as large as those of the Bagaces population. The significance of these observations, with respect to beetle distributions and also to taxonomic status of host populations, remains to be worked out. Also, Janzen states that a second *Pterocarpus* species has been reported from the Guanacaste lowlands, but he has not yet found a population of it.



Figs. 1-5, *Apion pterocarpi*: 1-3, lateral, ventral, and dorsal habitus outlines; 4, posterior aspect of left midleg; 5, ventral view of head.

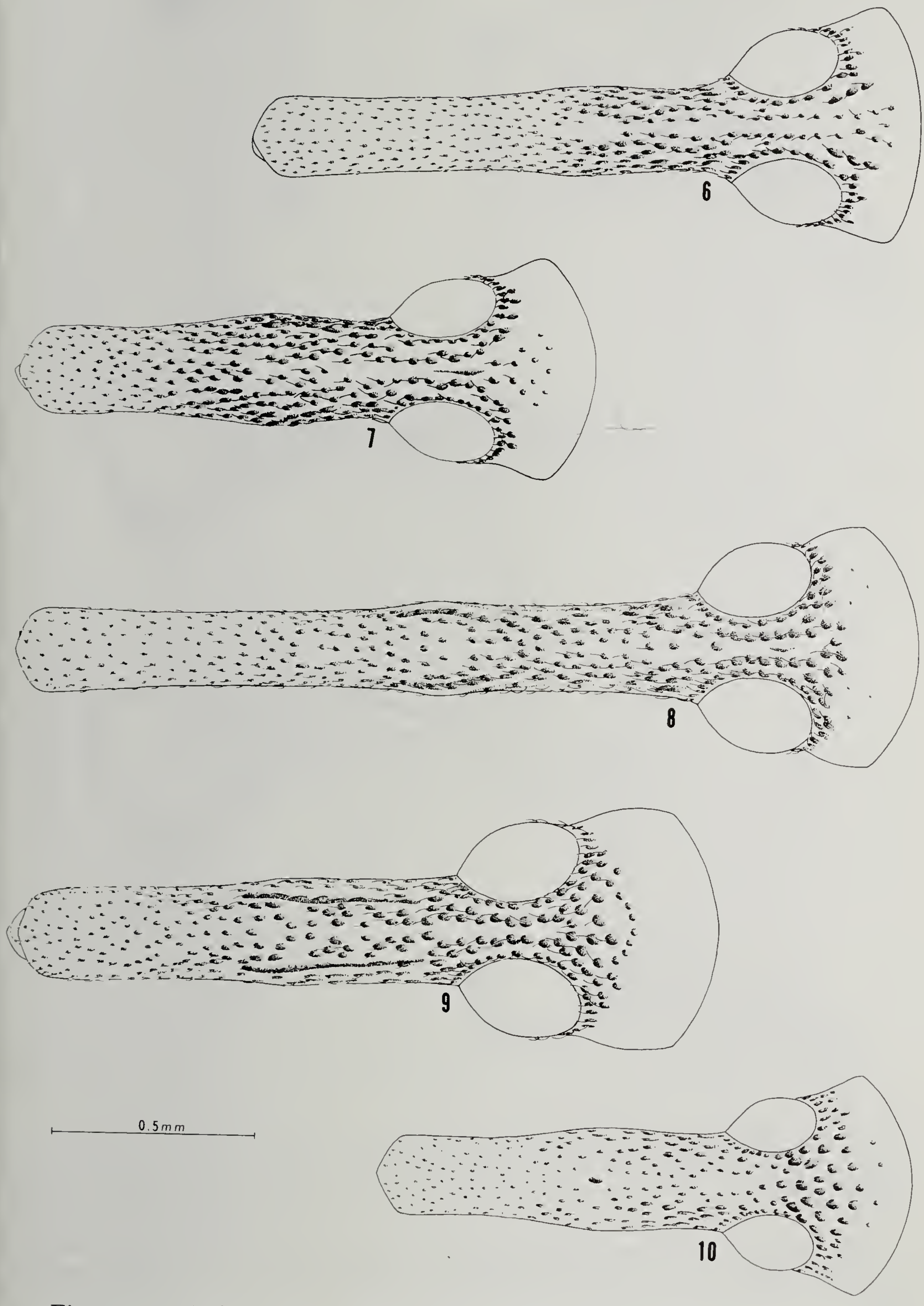
Description. Length 2.99-3.29 mm; width 1.20-1.29 mm. Body (figs. 1-3) moderately robust, elytra compressed; dark castaneous to piceous, unicolorous; vestiture white, fine, sparse, nearly uniform. Male beak (figs. 7, 12) 1.11-1.14 × longer than prothorax; in side view moderately curved, dorsal and ventral outlines slightly convergent in apical 1/3, apex depressed; in dorsal view sides strongly expanded at antennal insertion, nearly parallel in apical 1/3; surface finely alutaceous in basal 2/3, conspicuously so in apical 1/3, dorsum with small, paired, polished calluses above antennal insertions; punctures coarse, deep, dense in basal 2/3, finer and sparser toward apex, with fine vestiture throughout but scales much shorter toward apex. Female beak (figs. 6, 11) 1.48-1.63 × longer than prothorax; similar to beak of male except more slender, punctures finer and sparser, and basal vestiture sparser. Antenna inserted at basal 0.30-0.36 of beak, at distance in front of eye 2.1-2.6 (male) or 2.9-3.0 (female) × greater than width of frons; dorsal margin of scrobe irregularly angulate at antennal insertion, beyond this point slightly oblique for short distance. In dorsal view, eye slightly prominent; frons 0.65-0.76 × as wide as apex of beak, with 2 rows of coarse punctures separated by strong median and lateral carinae; in profile, dorsal margin of head moderately convex above eye, declivitous to point behind posterior margin of eye; ventral surface of head (fig. 5) with moderately high, broad lateral ridges extending to middle of eye. Prothorax at base 1.08-1.14 × wider than long, middle distinctly narrower than base, apex 0.60-0.66 × as wide as base; in dorsal view sides evenly converging from base to unconstricted apex, without basal flange; dorsal margin slightly convex, more strongly so in posterior 1/2, somewhat flattened in apical 1/2; on dorsal surface punctures 0.04-0.05 mm in diameter, moderately shallow, bearing fine scales mostly 0.03-0.04 mm long, scales project beyond anterior rims of punctures, interspaces much narrower than diameter of punctures, coarsely alutaceous; basal fovea 0.05-0.08 mm in diameter, not conspicuously elongated. Scutellum elongate, widest at base, flat or feebly impressed medially, set in weakly defined, basal, cordate elytral impression. Elytra at humeri 1.32-1.39 × wider than prothorax at base, 2.70-2.80 × longer than prothorax, 1.85-1.92 × longer than wide; intervals at middle about 3 times as wide as striae, nearly flat, with 2 partly confused rows of minute punctures bearing minute scales shorter than those on prothorax, intervals 7 and 9 each with 1 long specialized seta; striae moderately shallow, moderately coarse, inner portion of stria more strongly developed than lateral portion, on apex join 2 + 9 (or 1 + 2 + 9); 3 + 4; 5 + 6; 7 + 8; without pit on elytral apex at union of striae 1 and 9. Male characters: tibiae 2 and 3 mucronate, mucrones acute, triangular, barely projecting beyond apical fringe of setae (fig. 4). Phallus (figs. 16, 18) in side view moderately convex, apex very slightly produced ventrally; in dorsal view sides nearly parallel from base to orifice, beyond orifice converging to narrow apex; internal sac without conspicuous armature; posterior apophyses approximately 0.40-0.45 × as long as rest of median lobe. Paramere (fig. 17) moderately long, moderately slender; apical lobes short, broad, microtrichiae numerous, without conspicuous large setae; without distinct transverse clear areas; with short, slender basal lateral projections articulating with basal piece; basal median area with low ridge, with short basal median projection.

Apion (Coelocephalapion) pepperi Whitehead, **new species**

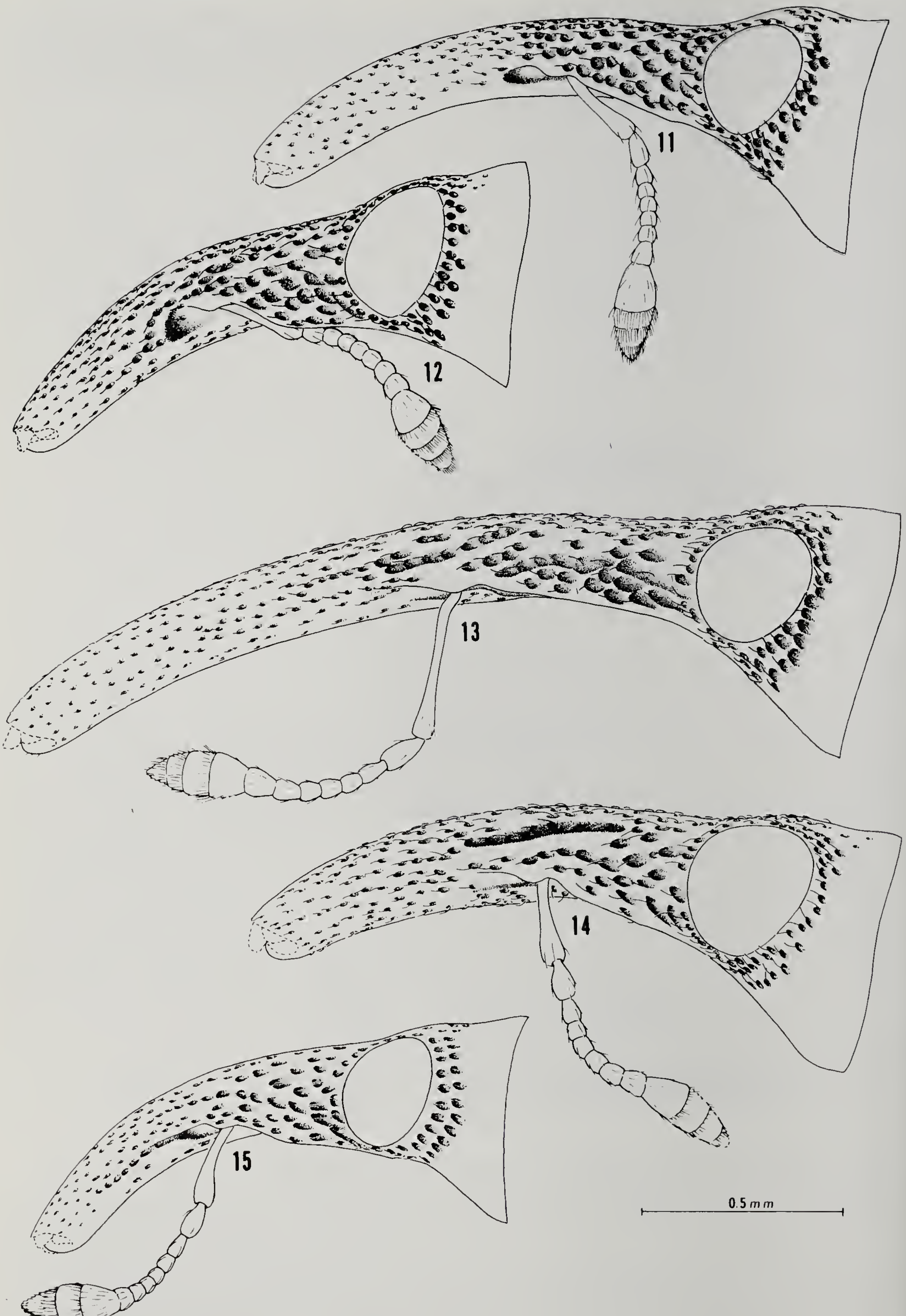
Figs. 8-9, 13-14, 19-21

Type-material. Holotype male (USNM #75313), allotype female, and 2 paratypes labelled "MEXICO. intercepted San Antonio 004677 (73-4781) / ex fruit Pterocarpus amphymenium DC.". In U.S. National Museum of Natural History.

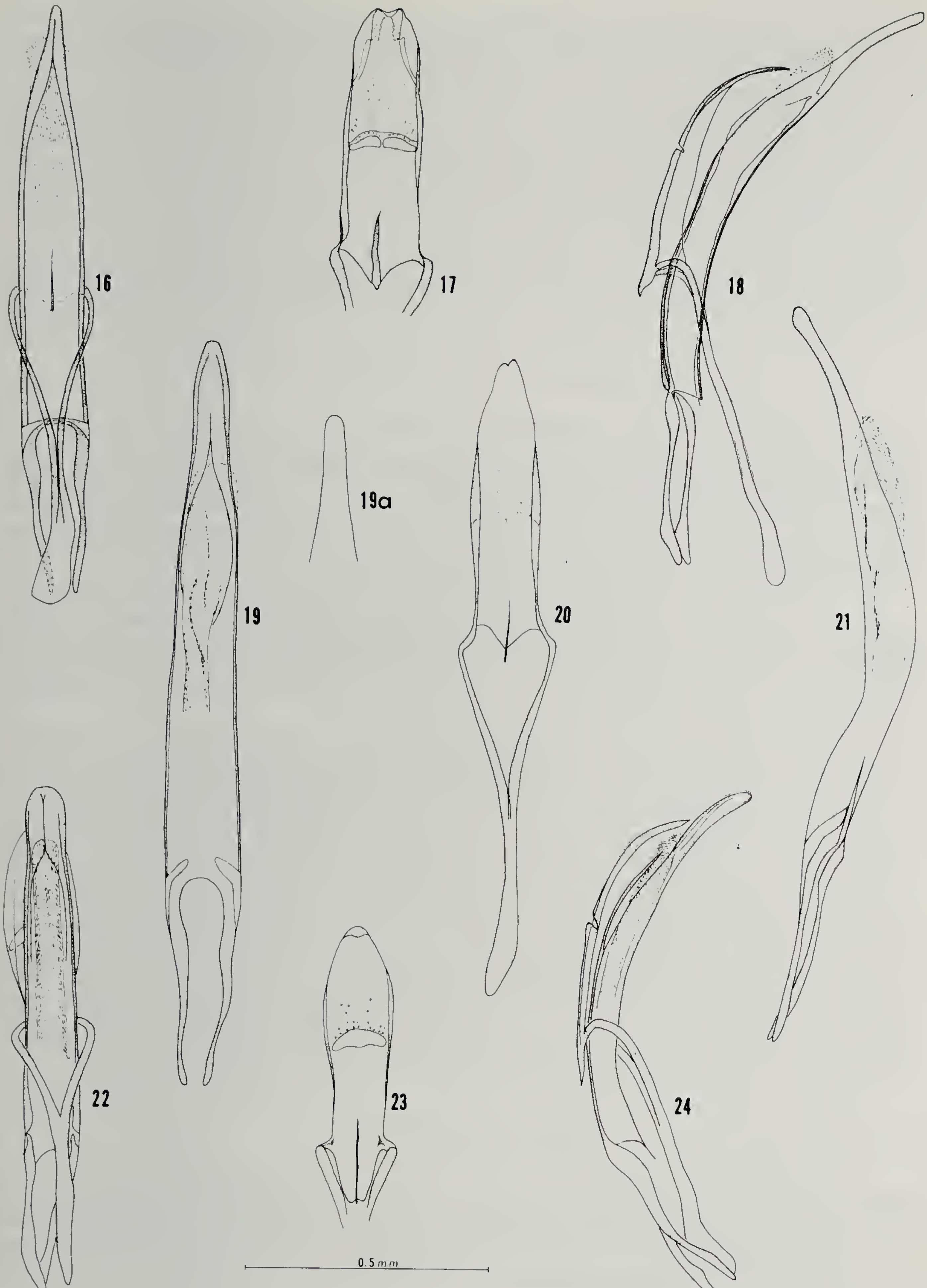
Comments. I am pleased to name this species for the late Prof. Bailey B. Pepper of Rutgers University. The host species is *Pterocarpus orbiculatus* DC, although USNM herbarium specimens were determined as *P. amphymenium* DC by J. P. Rojo in 1969. Fruits of this species are strongly pubescent and thus are easily distinguished from other Mexican and Central American *Pterocarpus*; determination of the host plant was made by me, from fruit samples submitted with the beetles. The collection supposedly originated from Mexico City, but the host species occurs at lower elevations (up to about 1000 m, in Guerrero, Jalisco, Michoacán, and Oaxaca as judged from USNM herbarium material). From this host distribution, I suspect that *A. pepperi* is endemic to central Mexico.



Figs. 6-10, *Apion* spp., dorsal view of head: 6, *A. pterocarpi*, female; 7, same, male; 8, *A. pepperi*, female; 9, same, male; 10, *A. cartwrighti*, male.



Figs. 11-15, *Apion* spp., lateral view of head: 11, *A. pterocarpi*, female; 12, same, male; 13, *A. pepperi*, female; 14, same, male; 15, *A. cartwrighti*, male.



Figs. 16-24, *Apion* spp., male genitalia, showing ventral view, paramere, and lateral view: 16-18, *A. pterocarpi*; 19-21, *A. pepperi* (ventral and lateral views shown without paramere; 19a shows variation in apex of phallus); 22-24, *A. cartwrighti*.

Description. Similar to *A. pterocarpi* except as follows. Length 3.68-3.80 mm; width 1.44-1.46 mm. Vestiture longer, conspicuous at low magnification. Male beak (figs. 9, 14) 1.19-1.24 × longer than prothorax; female beak (figs. 8, 13) 1.91-1.96 × longer than prothorax. Antenna inserted at basal 0.32-0.36 of beak, at distance in front of eye 2.4-2.5 (male) or 3.1-3.2 (female) × greater than width of frons. Frons 0.73-0.91 × as wide as apex of beak. Prothorax at base 1.14-1.19 × wider than long, apex 0.60-0.62 × as wide as base; on dorsal surface punctures 0.05-0.06 mm in diameter, bearing scales mostly 0.05-0.06 mm long; basal fovea in some specimens linear. Elytra at humeri 1.30-1.31 × wider than prothorax at base, 2.85-2.91 × longer than pronotum, 1.85-1.90 × longer than wide; scales on intervals conspicuous, about 2/3 as long as those of pronotum, strial scales about 1/2 as long as those of intervals. Phallus (figs. 19, 21), apex less strongly narrowed. Paramere (fig. 20), apical lobes narrower.

Apion (Coelocephalapion) cartwrighti Whitehead, **new species**

Figs. 10, 15, 22-24

Type-material. Holotype male (USNM #75314) labelled "Turrialba Costa Rica 6 June 1951 OLCartwright"; male paratype labelled "Hamburgfarm StaClaraPr CostaRica Nov. 22 1921/Nevermann Collection 1940". In U.S. National Museum of Natural History.

Comments. It is my pleasure to dedicate this species to Oscar Cartwright, emeritus Smithsonian entomologist. *A. cartwrighti* occurs in a region occupied by 3 or 4 species of *Pterocarpus*, and I predict that one of them is its host plant. *A. cartwrighti* and *A. pterocarpi,* presently known from different areas in Costa Rica, probably are sympatric.

Description. Similar to *A. pterocarpi* except as follows (female not known). Length 2.80-2.90 mm; width 1.20-1.29 mm. Vestiture less conspicuous. Male beak (figs. 10, 15) 1.21-1.29 × longer than prothorax; surface conspicuously alutaceous throughout except for polished calluses; punctures much less coarse and dense, interspaces broad and flat, vestiture minute. Antenna inserted at basal 0.35-0.38 of beak, at distance in front of eye 2.0-2.1 × greater than width of frons; dorsal margin of scrobe less angulate at antennal insertion. Frons 0.85-0.90 × as wide as apex of beak, with 2 rows of coarse punctures separated by low, irregular median and lateral carinae. Prothorax at base 1.13-1.23 × wider than long, apex 0.50-0.58 × as wide as base; on dorsal surface punctures less dense, bearing minute scales about 0.02-0.03 mm long; basal fovea more elongated. Scutellum ovate. Elytra at humeri 1.39-1.42 × wider than pronotum at base, 2.70-2.86 × longer than pronotum, 1.69-1.72 × longer than wide; on apex striae join 1 + 9; 3 + 4; 5 + 6; 7 + 8. Phallus (figs. 22, 24), apex broad. Paramere (fig. 23), apical lobes undivided; basal median projection long.

REFERENCE CITED

KISSINGER, D. G. 1968. Curculionidae subfamily Apioninae of North and Central America, with reviews of the world genera of Apioninae and world subgenera of *Apion* Herbst (Coleoptera). Taxonomic Publications, South Lancaster, Mass. vii + 559 p.

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